

FORM PTO-1390
(REV 5-93)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A
FILING UNDER 35 U.S.C. 371**

225/49578

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

09/744149

INTERNATIONAL APPLICATION NO.
PCT/EP99/04640

INTERNATIONAL FILING DATE
July 3, 1999

PRIORITY DATE CLAIMED
July 21, 1998

TITLE OF INVENTION

ADHESIVE SYSTEM FOR FORMING REVERSIBLE ADHESIVE BONDS

APPLICANT(S) FOR DO/EO/US

Peter BECHER et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). UNEXECUTED
10. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Item 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:
PCT/IB/308



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U.S. APPLICATION NO (if known, see 37 CFR 1.5)		INTERNATIONAL APPLICATION NO		ATTORNEY'S DOCKET NUMBER	
09/744149		PCT/EP99/04640		225/49578	
17. [X] The following fees are submitted:				CALCULATIONS	
Basic National Fee (37 CFR 1.492(a)(1)-(5)); Search Report has been prepared by the EPO or JPO				\$860.00	
International preliminary examination fee paid to USPTO (37 CFR 1.482) ..				\$690.00	
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))				\$710.00	
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO				\$1000.00	
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)				\$100.00	
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$ 860.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than [] 20 [X] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$ 130.00	
Claims	Number Filed	Number Extra	Rate		
Total Claims	27 - 20 =	7	X \$18.00	\$ 126.00	
Independent Claims	1 - 3 =	0	X \$80.00	\$	
Multiple dependent claims(s) (if applicable)			+ \$270.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$ 1,116.00	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				\$	
SUBTOTAL =				\$ 1,116.00	
Processing fee of \$130.00 for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				+	
TOTAL NATIONAL FEE =				\$ 1,116.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28,3.31). \$40.00 per property +				\$	
TOTAL FEE ENCLOSED =				\$ 1,116.00	
				Amount to be: refunded	\$
				charged	\$
<p>a. [X] One check in the amount of \$1,116.00 for the filing fee is enclosed</p> <p>b. [] Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. [X] The Commissioner is hereby authorized to charge any additional fees, which may be required, or credit any overpayment to Deposit Account No. 05-1323. A duplicate copy of this sheet is enclosed.</p> <p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p>					
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				January 22, 2001	
				DATE	

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J002 Rec'd PCT/PTO 22 JAN 2001

Attorney Docket: 225/49578
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: PETER BECHER ET AL.

PCT International Application PCT/EP99/04640

Serial No.: NOT YET ASSIGNED Group Art Unit:

Filed: January 22, 2001 Examiner:

Title: ADHESIVE SYSTEM TO FORM REVERSIBLE GLUED JOINTS

PRELIMINARY AMENDMENT

Box PCT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Please enter the following amendments to the claims, as amended by way of Annexes to the International Preliminary Examination Report for PCT/EP99/04640, prior to the examination of the application during the U.S. National Phase.

IN THE SPECIFICATION:

Page 1, line 15, insert --BACKGROUND AND SUMMARY OF THE INVENTION--.

Page 2, line 33, insert --DETAILED DESCRIPTION OF THE INVENTION--.

Page 8, line 14, change "Patent Claims" to --WHAT IS CLAIMED IS--.

IN THE CLAIMS:

Please cancel Claims 1-17 without prejudice to or disclaimer of the subject matter therein.

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Please insert Claims 18-44 as follows:

--18. An adhesive system for forming reversible adhesive bonds, comprising:

a polymeric adhesive component comprising at least one of polyurethanes, polyureas, or epoxy resins; and

an additional component comprising at least one functional group that can be activated by introduction of energy, such that a chemical reaction with the adhesive component takes place resulting in at least partial breakdown of the adhesive component.

19. An adhesive system according to Claim 18, wherein the additional component is admixed with the adhesive component.

20. An adhesive system according to Claim 18, wherein the additional component is activatable by thermal energy or by radiative energy.

21. An adhesive system according to Claim 18, wherein the additional component further comprises at least one protective group that blocks reactivity of the additional component.

22. An adhesive system according to Claim 18, wherein the additional component is enclosed in a capsule or microcapsule that blocks the reactivity of the additional component.

23. An adhesive system according to Claim 18, wherein the additional component is complexed with an inorganic complexing agents that blocks the reactivity of the additional component.

24. An adhesive system according to Claim 21, wherein blocking of the additional component by the protective group can be eliminated by at least one of thermal energy or radiative energy.

25. An adhesive system according to Claim 22, wherein blocking of the additional component by the capsule or microcapsule can be eliminated by at least one of thermal energy or radiative energy.

26. An adhesive system according to Claim 18, wherein the additional component comprises one or more organic amines.

27. An adhesive system according to Claim 18, wherein the adhesive component is an epoxy resin and the additional component comprises one or more organic acids.

28. An adhesive system according to Claim 26, wherein the one or more organic amines are enclosed in capsules or microcapsules.

29. An adhesive system according to Claim 28, wherein the capsules or microcapsules comprise amino resin.

30. An adhesive system according to Claim 27, wherein the one or more organic acids are enclosed in capsules or microcapsules.

31. An adhesive system according to Claim 30, wherein the capsules or microcapsules comprise amino resin.

32. An adhesive system according to Claim 26, wherein the one or more organic amines is incorporated in a metal halide complex.

33. An adhesive system according to Claim 32, wherein the metal halide complex comprises lithium bromide or sodium chloride.

34. An adhesive system according to Claim 26, wherein the adhesive component further comprises at least one chemically attached structural component, wherein the structural component is selected so that upon activation of the additional component, a chemical reaction occurs with the structural component resulting in at least partial breakdown of the adhesive component.

35. An adhesive system according to Claim 34, wherein the at least one structural component is incorporated by copolymerization into the adhesive component.

36. An adhesive system according to Claim 34, wherein the at least one structural component is a triazine derivative.

37. A process for the reversible bonding of articles and controlled parting of the adhesive bonds between these articles, said process comprising:

preparing an adhesive bond between articles with an adhesive system according to Claim 18;

deactivating the adhesive bond by introducing energy; and

separating the articles from one another.

38. A process according to Claim 37, wherein the introducing of energy comprises supplying heat.

39. A process according to Claim 38, wherein the supplying of heat is by thermal conduction or convection.

40. A process according to Claim 38, wherein the supplying of heat is by electromagnetic radiation.

41. A process according to Claim 40, wherein the electromagnetic radiation comprises infrared radiation or microwaves.

42. A process according to Claim 37, wherein the articles comprise a material selected from the group consisting metal, plastics, glass, textiles, and combinations of these materials.

43. A process according to Claim 37, wherein the articles are components of a motor vehicle.

44. A production line adhesive comprising an adhesive system according to Claim 18.--

IN THE ABSTRACT:

Please delete the Abstract of the Disclosure in its entirety and substitute therefore the attached Abstract.

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REMARKS

Entry of the amendments to the claims before examination of the application in the U.S. National Phase is respectfully requested.

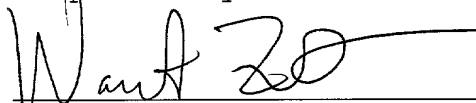
Because the U.S. Patent and Trademark Office receives copies of the references cited in the International Search Report from the International Bureau, Applicants respectfully request the Examiner to list the following references on a form PTO-892: U.S. Patent No. 3,871,911; U.S. Patent No. 4,882,399; and DE 92-16 278.

If there are any questions regarding this Preliminary Amendment or this application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #225/49578).

January 22, 2001

Respectfully submitted,


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--ABSTRACT OF THE DISCLOSURE

An adhesive system for forming reversible adhesive bonds includes at least one polymeric adhesive component comprising at least one of polyurethanes, polyureas, or epoxy resins and at least one additional component that includes a functional group that can be activated by the introduction of energy, such that a chemical reaction with the adhesive component takes place involving a partial breakdown of the adhesive component. Reversible bonding of articles and controlled parting of an adhesive bond between articles can be achieved with the adhesive system.--

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Adhesive system for forming reversible adhesive bonds

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The present invention relates to an adhesive system for forming reversible adhesive bonds, comprising at least one polymeric adhesive component based on polyurethanes and/or polyureas and/or epoxy resins and at least one additional component. The present invention further relates to a process for the reversible bonding of articles and controlled parting of the adhesive bond obtained.

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25 In a very wide variety of technical fields, articles are nowadays bonded to one another. In particular welded connections which have been customary to date are being replaced by adhesive bonds. High-strength adhesive bonds with resistance properties are required for this purpose.
30 This is especially the case in connection with the production of motor vehicles. A disadvantage with this method of construction is that, for a refinish or for recycling, the individual bonded components of the motor vehicles are difficult to separate, their separation
35 being time-consuming and requiring force: for example, by means of a hammer and chisel, or by sawing or flame cutting.

30

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Adhesive systems of this generic type are known, for
40 example, from US 45 99 273. This document relates to surface-active substances whose surface-active effect is blocked by additional components in the form of

photolabile protective groups. By exposure to radiation, the protective groups are removed and the surface-active effect is re-established. Surface-active substances of this kind may also comprise coatings which may be applied reversibly. However, they cannot be used to realize high-strength adhesive bonds.

DE 92 16 278 U1 discloses pressure-sensitive adhesives with which components of motor vehicles can be reversibly bonded to one another. These adhesives too cannot be used to realize high-strength adhesive bonds.

It is therefore the object of the present invention to provide adhesive systems of the type specified above with which high-strength adhesive bonds can be produced and which in a simple manner permit controlled mechanical separation of the articles bonded to one another.

This object is achieved by the at least one additional component comprising at least one functional group which can be activated by introduction of energy, in such a way that a chemical reaction with the adhesive component takes place, involving at least partial breakdown of the adhesive component.

25

The process of the invention is distinguished by the following steps:

- preparation of an adhesive bond using an adhesive system of the invention,
- 30 - deactivation of the adhesive bond by introduction of energy,
- separation of the articles from one another.

The adhesive system of the invention and, respectively, the process of the invention therefore make it possible to produce high-strength adhesive bonds by means of high-performance adhesives which are known in principle and are based on polyurethanes, polyureas and/or epoxy resins, which can be weakened in a controlled manner by supplying energy and so can be parted again. This is

accompanied by a severe alteration in the molecular mass and/or the crosslinking density of the adhesive base polymer, i.e. the adhesive component. This leads to a loss of the mechanical strength of the adhesive.

- 5 Accordingly, the articles bonded to one another can easily and simply be separated mechanically from one another at any time. This signifies a considerable saving in terms of time and cost.
- 10 Advantageous developments are evident from the subclaims. The additional component may simply be admixed to the adhesive system of the invention in the manner of an additive.
- 15 The additional component may be activatable by introduction of thermal energy, e.g. thermal conduction, convection or IR radiation, or by introduction of radiative energy of appropriate wavelength, especially microwaves.
- 20 It is also possible to use additional components which react spontaneously with the adhesive component without further activation. In this case, the additional components should be blocked, i.e. reduced in their
- 25 reactivity. This can be done by attaching protective groups, by encapsulation or microencapsulation, or by complexing with an inorganic complexing agent. Deblocking is then preferably likewise activatable by introduction of thermal energy, e.g. thermal conduction or convection,
- 30 and/or by introduction of radiative energy, especially microwaves or IR radiation.

Examples of suitable additional components are organic amines or organic acids. Organic bases result in base-

35 catalysed cleavage of the epoxide backbone or of the urethane or urea bonds in the polymer backbone of the corresponding polymers. The epoxide backbone may also be cleaved using organic acids.

40 The organic amines and acids are blocked in their

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reactivity by providing them with protective groups or enclosing them in capsules or microcapsules, especially made of amino resin. Amines may also be complexed in a metal halide complex, preferably with lithium bromide or sodium chloride. These methods of deactivation are known in principle, for example from synthetic organic chemistry or in the case of depot active substances.

A further preferred embodiment of the present invention is that in which the adhesive component is chemically modified. The chemical modification consists in chemically attaching one or more structural components to the adhesive component, preferably by copolymerization. The structural components are chosen so that they react with the additional component, so that they are broken down. By this means, the adhesive component as well is weakened or completely destroyed.

Preferred structural components are triazine derivatives. Where triazines are incorporated by copolymerization into the adhesive component, cyanurate radicals are formed in the polymer backbone. On reaction with an amine, the triazine ring brings about the decomposition of the cyanurate radicals via an aminolysis. Accordingly, the adhesive component breaks down as well.

The adhesive systems of the invention may be used to bond articles of metal, plastics, glass or textiles, in each case individually or with one another. They are particularly suitable for producing production line adhesives which are employed in particular in car making.

The present invention is illustrated below with reference to exemplary embodiments.

35

I. Example 1 (comparative example):

S2 test rods (DIN 53455) measuring 140 cm ' 10 cm ' 3 cm were produced. They were cast from a moisture-curing PU adhesive based on diphenylmethane diisocyanate and

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polyetherpolyol and were cured for 10 days. The tensile strength was tested at 23°C and 50% relative humidity. The tensile strength was 8 MPa.

5 II. Example 2

The procedure described under I. was repeated, with the addition of 3% by mass of a lithium bromide/triaminoethylamine complex to the polyurethane adhesive prior to
10 casting. The tensile strength of the test rods manufactured in this way was 8 MPa.

III. Example 3

15 The procedure described under I. was repeated, with the addition of 4% by mass of amino resin-encapsulated octylamine to the polyurethane adhesive prior to casting. The tensile strength of the test rods manufactured in this way was 7 MPa.

20

IV. Example 4

The procedure described under I. was repeated, with the addition of 3% by mass of a sodium chloride/4,4'-
25 diaminodiphenylmethane complex to the polyurethane adhesive prior to casting. The tensile strength of the test rods manufactured in this way was 7 MPa.

V. Deactivation of the adhesive bond

30

The test rods manufactured in accordance with Examples 1, 3 and 4 were heated at 175°C for 30 minutes. Their tensile strengths thereafter were as follows:

Example 1 (comparative example):	0.52 MPa
35 Example 3:	1.02 MPa
Example 4:	0.42 MPa

VI. Example 5 (comparative example)

40 The procedure described under I. was repeated, using a

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prepolymer in which 22% by mass of the polyetherpolyol was replaced by a 2,4,6-tris(w-hydroxypolyalkoxy)-1,3,5-triazine reacted with diphenylmethane diisocyanate. The tensile strength of the straight cured polymer (not formulated as an adhesive) was 1.1 MPa.

VII. Example 6

The procedure described under VI. was repeated, with the addition of 4% by mass of a sodium chloride/4,4'-diaminodiphenylmethane complex to the polyurethane adhesive prior to casting. The tensile strength of the test rods manufactured in this way was 1.2 MPa.

VIII. Deactivation of the adhesive bond

The test rods manufactured in accordance with Examples 5 and 6 were heated at 175°C for 30 minutes. Their tensile strengths thereafter were as follows:

Example 5 (comparative example):	1.2 MPa
Example 6:	0.2 MPa

IX. Example 7

2 g of tris(4-aminophenoxy)-1,3,5-triazine in solution in 10 g of aniline were mixed homogeneously at 90°C with 44 g of bisphenol A diglycidyl ether and, for the production of test strips, the mixture was cast in moulds as described under I. Curing took place at 90°C for 18 hours. By means of dynamic mechanical analysis, the glass transition temperature of the resulting material was found to be $T_g = 99^\circ\text{C}$. On heating to 120°C, a tacky mass without mechanical strength was formed.

X. Example 8

13.5 g of the reaction product of 150 g of bisphenol A diglycidyl ether with 15 g of tris(4-aminophenoxy)-1,3,5-triazine were placed in moulds, as in IX., with 2.7 g of trimethyl-1,6-diaminohexane and with the addition of 3 g

of N-tert-butyloxycarbonylaminoctane and the mixture was cured at 40°C for 20 hours. Dynamic mechanical analysis gave a glass transition temperature of $T_g = 80^\circ\text{C}$. After heating at a temperature of 200°C for at least 5 30 minutes, there was a rapid increase in the glass transition temperature. The material underwent embrittlement to such an extent that it broke even under the low stresses in the DMA instrument.

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Patent claims

- 15 1. Adhesive system for forming reversible adhesive
bonds, comprising at least one polymeric adhesive
component based on polyurethanes and/or polyureas
and/or epoxy resins and at least one additional
20 additional component comprises at least one
functional group which can be activated by
introduction of energy, in such a way that a
chemical reaction with the adhesive component takes
place, involving at least partial breakdown of the
25 adhesive component.
2. Adhesive system according to Claim 1, characterized
in that the additional component is admixed to the
adhesive component.
- 30 3. Adhesive system according to one of the preceding
claims, characterized in that the additional
component is activatable by thermal energy and/or by
radiative energy.
- 35 4. Adhesive system according to one of the preceding
claims, characterized in that the additional
component is blocked in its reactivity by at least
one protective group and/or by encapsulation and/or
40 by enclosure in inorganic structures and the
blocking can be eliminated by introduction of
energy.

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5. Adhesive system according to Claim 4, characterized in that the blocking can be eliminated by thermal energy and/or by radiative energy.
- 5 6. Adhesive system according to one of the preceding claims, characterized in that it comprises as additional component one or more organic amines.
- 10 7. Adhesive system according to one of Claims 1 to 5, characterized in that it comprises an adhesive component based on epoxy resins and, as additional component, one or more organic acids.
- 15 8. Adhesive system according to Claim 6 or 7, characterized in that the amine and/or the acid are enclosed in capsules or microcapsules, preferably made of amino resin.
- 20 9. Adhesive system according to Claim 6 or 7, characterized in that the amine is incorporated in a metal halide complex, especially with lithium bromide and/or sodium chloride.
- 25 10. Adhesive system according to one of the preceding claims, characterized in that the adhesive component has been modified by means of at least one structural component attached chemically to the adhesive component, the structural component being selected so that, as a result of the activation of
- 30 the additional component, a chemical reaction takes place with the structural component, involving at least partial breakdown of the adhesive component.
- 35 11. Adhesive system according to Claim 10, characterized in that the at least one structural component is incorporated by copolymerization into the adhesive component.
- 40 12. Adhesive system according to Claim 10 or 11, characterized in that the at least one structural

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component is at least one triazine derivative.

13. Process for the reversible bonding of articles and controlled parting of the adhesive bonds between these articles, characterized by the following steps:
- preparation of an adhesive bond using an adhesive system according to one of Claims 1 to 13,
 - deactivation of the adhesive bond by introduction of energy,
 - separation of the articles from one another.
14. Process according to Claim 13, characterized in that the energy is introduced by heat supply, especially by means of thermal conduction or convection, and/or electromagnetic radiation, especially infrared radiation or microwaves.
15. Process according to one of Claims 13 and 14, characterized in that articles of metal, plastics, glass or textiles are bonded, in each case individually or with one another.
16. Use of the adhesive system according to one of Claims 1 to 12 or of the process according to one of Claims 13 to 15 for bonding components in motor vehicles.
17. Use of the adhesive system according to one of Claims 1 to 12 for producing production line adhesives.

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Heidelberg

The present invention additionally relates to a process for the reversible bonding of articles and controlled parting of the adhesive bond between these articles, using an adhesive system of the invention.

1. 1990-1991		2. 1991-1992		3. 1992-1993		4. 1993-1994		5. 1994-1995		6. 1995-1996		7. 1996-1997		8. 1997-1998		9. 1998-1999		10. 1999-2000		11. 2000-2001		12. 2001-2002		13. 2002-2003		14. 2003-2004		15. 2004-2005		16. 2005-2006		17. 2006-2007		18. 2007-2008		19. 2008-2009		20. 2009-2010		21. 2010-2011		22. 2011-2012		23. 2012-2013		24. 2013-2014		25. 2014-2015		26. 2015-2016		27. 2016-2017		28. 2017-2018		29. 2018-2019		30. 2019-2020		31. 2020-2021		32. 2021-2022		33. 2022-2023		34. 2023-2024		35. 2024-2025		36. 2025-2026		37. 2026-2027		38. 2027-2028		39. 2028-2029		40. 2029-2030		41. 2030-2031		42. 2031-2032		43. 2032-2033		44. 2033-2034		45. 2034-2035		46. 2035-2036		47. 2036-2037		48. 2037-2038		49. 2038-2039		50. 2039-2040		51. 2040-2041		52. 2041-2042		53. 2042-2043		54. 2043-2044		55. 2044-2045		56. 2045-2046		57. 2046-2047		58. 2047-2048		59. 2048-2049		60. 2049-2050		61. 2050-2051		62. 2051-2052		63. 2052-2053		64. 2053-2054		65. 2054-2055		66. 2055-2056		67. 2056-2057		68. 2057-2058		69. 2058-2059		70. 2059-2060		71. 2060-2061		72. 2061-2062		73. 2062-2063		74. 2063-2064		75. 2064-2065		76. 2065-2066		77. 2066-2067		78. 2067-2068		79. 2068-2069		80. 2069-2070		81. 2070-2071		82. 2071-2072		83. 2072-2073		84. 2073-2074		85. 2074-2075		86. 2075-2076		87. 2076-2077		88. 2077-2078		89. 2078-2079		90. 2079-2080		91. 2080-2081		92. 2081-2082		93. 2082-2083		94. 2083-2084		95. 2084-2085		96. 2085-2086		97. 2086-2087		98. 2087-2088		99. 2088-2089		100. 2089-2090		101. 2090-2091		102. 2091-2092		103. 2092-2093		104. 2093-2094		105. 2094-2095		106. 2095-2096		107. 2096-2097		108. 2097-2098		109. 2098-2099		110. 2099-2100		111. 2100-2101		112. 2101-2102		113. 2102-2103		114. 2103-2104		115. 2104-2105		116. 2105-2106		117. 2106-2107		118. 2107-2108		119. 2108-2109		120. 2109-2110		121. 2110-2111		122. 2111-2112		123. 2112-2113		124. 2113-2114		125. 2114-2115		126. 2115-2116		127. 2116-2117		128. 2117-2118		129. 2118-2119		130. 2119-2120		131. 2120-2121		132. 2121-2122		133. 2122-2123		134. 2123-2124		135. 2124-2125		136. 2125-2126		137. 2126-2127		138. 2127-2128		139. 2128-2129		140. 2129-2130		141. 2130-2131		142. 2131-2132		143. 2132-2133		144. 2133-2134		145. 2134-2135		146. 2135-2136		147. 2136-2137		148. 2137-2138		149. 2138-2139		150. 2139-2140		151. 2140-2141		152. 2141-2142		153. 2142-2143		154. 2143-2144		155. 2144-2145		156. 2145-2146		157. 2146-2147		158. 2147-2148		159. 2148-2149		160. 2149-2150		161. 2150-2151		162. 2151-2152		163. 2152-2153		164. 2153-2154		165. 2154-2155		166. 2155-2156		167. 2156-2157		168. 2157-2158		169. 2158-2159		170. 2159-2160		171. 2160-2161		172. 2161-2162		173. 2162-2163		174. 2163-2164		175. 2164-2165		176. 2165-2166		177. 2166-2167		178. 2167-2168		179. 2168-2169		180. 2169-2170		181. 2170-2171		182. 2171-2172		1	
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DECLARATION AND POWER OF ATTORNEY - PATENT APPLICATION

As a below named inventor, I hereby declare that my citizenship, postal address and residence are as stated below; that I verily believe I am the original, first and sole inventor (if only one inventor is named below) or a joint inventor (if plural inventors are named below) of the invention entitled:

ADHESIVE SYSTEM FOR FORMING REVERSIBLE ADHESIVE BONDS

the specification of which

_____ is attached hereto, or
X was filed as PCT International Application No. PCT/EP99/04640 on July 3, 1999, as amended on May 16, 2000 (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose all information known to be material to patentability as defined in 37 CFR §1.56. I hereby claim foreign priority benefits under Title 35, United States Code §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)	Priority Claimed
<u>198 32 629.7</u> (Number)	<u>Germany</u> (Country)
	<u>21 July, 1998</u> (Day/Month/Year)
	<u>yes</u>

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose all information known to be material to patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status)
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I hereby appoint as principal attorneys Herbert I. Cantor, Reg. No. 24,392; James F. McKeown, Reg. No. 25,406; Donald D. Evenson, Reg. No. 26,160; Joseph D. Evans, Reg. No. 26,269; Gary R. Edwards, Reg. No. 31,824; and Jeffrey D. Sanok, Reg. No. 32,169, to prosecute and transact all business in the Patent and Trademark Office connected with this application and any related United States and international applications. Please direct all communications to:

Evenson, McKeown, Edwards & Lenahan, P.L.L.C.
1200 G Street, N.W., Suite 700
Washington, D.C. 20005
Telephone: (202) 628-8800
Facsimile: (202) 628-8844

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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 Residence:

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01-02-01
 (date)

Peter Becher
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23911
 PATENT TRADEMARK OFFICE

DECLARATION AND POWER OF ATTORNEY

Attorney Docket No. 225/49578

Page 2

INVENTOR: 2 - 00

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(date)



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3. März 2001

(date)



(signature of 4th inventor)

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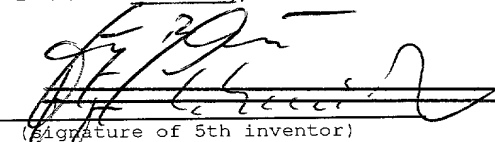
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(date)



(signature of 5th inventor)

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Over

DECLARATION AND POWER OF ATTORNEY

Attorney Docket No. 225/49578

Page 3

INVENTOR: 8 - 00

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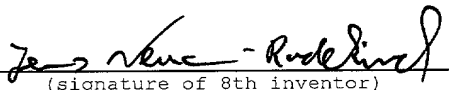
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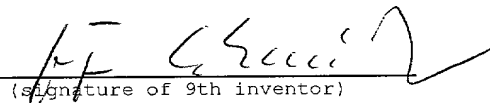
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INVENTOR: 10 - 00

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(date)


(signature of 10th inventor)

205220 "GHTT460"

25 JUL 2001

#3

Attorney Docket: 225/49578
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: PETER BECHER ET AL.

Serial No.: 09/744,149 Group Art Unit:

Filed: JANUARY 22, 2001 Examiner:

Title: ADHESIVE SYSTEM TO FORM REVERSIBLE GLUED JOINTS

CHANGE OF CORRESPONDENCE ADDRESS

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Commissioner for Patents
Washington, D.C. 20231

Sir:

This is to advise of a change of address for the undersigned attorneys and the forwarding of mail with regard to the matter identified in caption, as follows:

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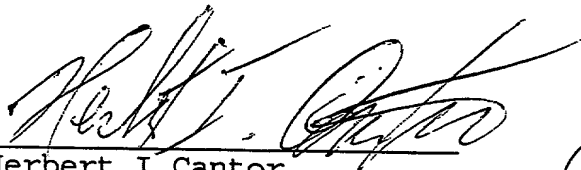
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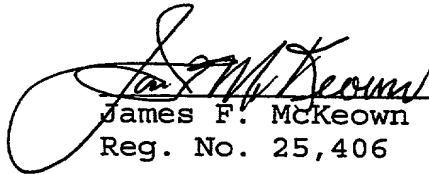
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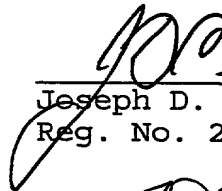
Respectfully submitted,



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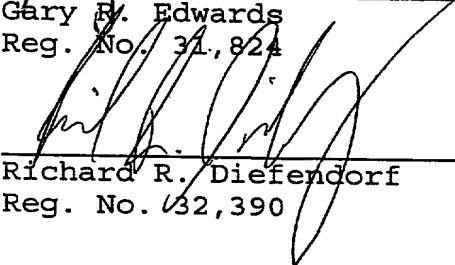
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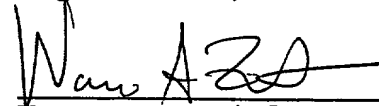
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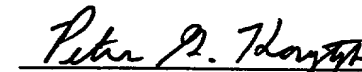
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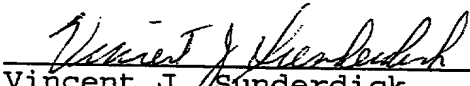
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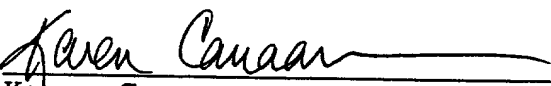
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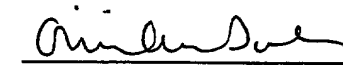
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Ref. 2156/02474

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